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## II.—VIRGIL'S INSTRUCTIONS FOR PLOUGHING, FALLOWING, AND THE ROTATION OF CROPS.

GEORGICS I, 43-83.

### I. PLOUGHING.

Virgil's directions for ploughing are contained in verses 43-49 and 63-70 of the first book of the Georgics. They are very brief, touching indeed only on the first of the three ploughings which Italian husbandry prescribed to prepare the field for a grain-crop; but they are quite distinct as far as they go, with the exception of vss. 47-49, which I print here from Ribbeck's text :

Illa seges demum uotis respondet auari  
agricolae, bis quae solem, bis frigora sensit;  
illius immensae ruperunt horrea messes.

Virgil's readers were not quite sure of his meaning here, even in the time of the elder Pliny, who says: 'Quarto seri sulco Vergilius *existimatur* uoluisse cum dixit optimam esse segetem quae bis solem, bis frigora sensisset.'<sup>1</sup> The explanation given by most recent editors of the Georgics<sup>2</sup> is that of Heyne, who accepts the view of Pliny's contemporaries that Virgil advocated four ploughings, and places the first of these in the autumn, a whole year before seed-time. The ground would then, he explains, 'feel' the cold twice and the heat twice, 'quia bis in hibernum, bis in aestivum (vere et aestate) tempus aratio talis incidit.' And he refers to a passage in Theophrastus, which will be quoted presently,<sup>3</sup> to show that this method was practiced in Greece.

It will be observed that Heyne understands by 'sensit' the exposure of the land to the effects of heat and cold by ploughing only. This has somewhat weakened his case; for both of his 'hiberna tempora' fall in autumn, and one of his 'aestiva tempora' in early spring, when the ground has barely begun to thaw. He

<sup>1</sup> N. H., XVIII, xx, 181.

<sup>2</sup> Wagner, Forbiger, Ladewig, Conington, Kennedy, Benoist, and others.

<sup>3</sup> Page 427.

has followed Theophrastus too closely, and taken 'seges' as no more than the latter's ἡ γῆ. But Theophrastus is speaking only of the preparation of the land, and says nothing of two exposures to the extremes of temperature. Virgil's use of *seges* suggests a better interpretation. For *seges* is properly the field with the crop on it,<sup>1</sup> and only by an extension of its meaning is it applied to the period of preparation. On the other hand the exposure of the soil to heat and cold implied in 'sensit' did not cease with the last ploughing; hoeing and weeding (*sarritio*, *runcatio*) which were continued till late in the spring, kept the ground soft and, as the poet would say, *sensitive*, while the crop was growing. In short, the two periods cannot be separated,—the period of preparation and the period of growth. Standing by the first furrow, the poet looks forward to the harvest, (cf. 'votis respondet auari agricolae,') and tells the farmer (vs. 49) that if he would have bursting barns, he must begin to plough so early that his grain-field shall have felt the warmth of two summers and the cold of two winters.

Taking *seges* in this wider sense, Heyne's theory of an autumn ploughing certainly furnishes the most natural interpretation of these three verses, taken by themselves. Unfortunately, the moment we read them with the context we meet with serious difficulty. A brief review will show this.

The first book of the Georgics properly begins at vs. 43, the first forty-two verses being of the nature of a general introduction to the whole poem. It opens somewhat after the epic fashion. The poet sets his reader at once in the field, in the midst of the first labors of the year, with his hand on the plough, and urges him to vigorous work, reserving till some verses later on the injunction that should logically precede, to familiarize himself with the character of his farm, the climate of the district, and other points which he must know if he would use his soil to the best advantage. Leaving out this digression, which occupies fourteen verses immediately after those now under discussion, and accepting Heyne's interpretation of the latter, we find Virgil's instructions for the first ploughing substantially as follows: In early spring, when the ground thaws, let the ploughing begin (43-46); the crop that bursts your barn is the one for which you began to plough in the autumn (47-49). . . . Up, then, and turn the rich soil in the very first months of the year (63 ff.). The transition from the first to

<sup>1</sup> Varro, R. R., I., xxix.

the second of these precepts is sufficiently abrupt; the second and third can in no way be brought into harmony, and Wagner<sup>1</sup> was quite right in the corollary which he added to Heyne's theory, that verses 47-49 could have been no part of the original poem, but were probably written by Virgil on the margin of his copy, and inserted in the text by some later hand.<sup>2</sup>

Wagner was right, if you accept his premises; but his conclusion was one of a kind that should always be received with caution, and it ought to have led to a more careful examination of his premises than they seem to have received. For my part I am convinced that both premises and conclusion are wrong; that Heyne's autumn ploughing is purely imaginary, and that our three verses are quite genuine and consistent with the context.

In the first place, the language of the verses is too vague to have suggested autumn ploughing, unless the poet's readers were acquainted with the practice. What evidence is there, then, that such a practice existed? So far as I can find, there is absolutely none. Heyne's sole authority is Theophrastus, in whose account of Greek agriculture he thinks he finds mention of autumn ploughing. The passages he refers to are these: ἡ δὲ κατεργασία ἐν τῷ νεῶν κατ' ἀμφοτέρωθεν τὰς ὥρας καὶ θέρους καὶ χειμῶνος ὅπως χειμασθῇ καὶ ἡλιωθῇ ἡ γῆ. . . ἀγαθὴν γὰρ οὔνται τὴν χιόνα ταῖς χειμεριναῖς νύκτας καὶ οὐχ ἥττον τὴν πάχυνον εἶναι. διεσθίειν γὰρ καὶ μακρὸν τὴν γῆν. καὶ ὅταν μετὰ τοὺς πρῶτους ἀρότους νεάσωσι πάλιν τοῦ ἥρος μεταβάλλουσιν, ὅπως τὴν ἀναφυομένην πόναν ἀπολέσωσιν, εἴτα θέρει ἀροῦσι, καὶ πάλιν ὅταν μέλλωσι σπείρειν.<sup>3</sup> That Virgil, who derived much of his knowledge of husbandry from books, was influenced by the Greek practice, and even by this very passage, is highly probable, as will appear presently. But what we have here is not *autumn* but *winter* ploughing.

Any evidence, however, that could be adduced to show that autumn ploughing was practiced in Greece would afford at best only a presumption that the same practice may have existed in Italy, and would have little weight against the absolute silence of the Roman agricultural writers on the subject. Cato, Varro, and Columella treat the general subject of ploughing with great fullness

<sup>1</sup> On IV, 203 (critical note).

<sup>2</sup> Ribbeck (Prolegg. p. 31) does not seem to understand the difficulty. He replies successfully enough to a charge of inconsistency between our text and verses 67 ff.; but if any one has made such a charge, it has nothing to do with the question before us.

<sup>3</sup> C. P., III, xx (xxv H) 7 f.

and give minute directions for varying conditions of soil and climate; but no one of them gives the slightest hint that he had ever heard of autumn ploughing. Pliny, who has added to his own observations a great store of information compiled from every writer of any consequence who had touched on the subject, not only states what were the common and approved methods, but notices local customs of various parts of Italy and Greece, and in particular often quotes Virgil's precepts, sometimes remarking their divergence from those of other writers or from the general practice. Now Pliny quotes these very verses,<sup>1</sup> adding an explanation of them as they were understood in his time: Virgil was supposed to advocate four ploughings for a crop, instead of the customary three. Could Pliny have failed to add that the first of the four was to be in the autumn, if he had suspected that such was Virgil's meaning? I do not see how negative evidence could well be stronger; but if any doubt remains of Pliny's opinion, it should be set at rest by another passage,<sup>2</sup> where in referring to Virgil's early-spring ploughing he distinctly calls it a first-ploughing (*proscindere*).

In seeking the true interpretation of the verses before us, it will be useful to compare Virgil's instructions for ploughing with those of the Roman prose-writers on husbandry. From a review of these authorities it will appear that when Virgil directs the farmer to plough rich soil in the first months of the year and poor soil in the fall,<sup>3</sup> he merely touches upon the two extremes of the season of first-ploughing, the proper time for which varied with the climate of the district, the situation of the land, the character of the soil, and other details that could not well find a place in verse. In warm districts ploughing may begin earlier than in cold, dry soils may be ploughed earlier than moist, compact than loose, rich than poor, hill earlier than plain.<sup>4</sup> Rich uplands are to be first ploughed after the spring crops are planted, though if the situation is dry and the climate warm they may be ploughed as early as February;<sup>5</sup> damp levels after the ides of April.<sup>6</sup> Fallow land may be first ploughed as late as mid-summer, if the season has been rainy.<sup>7</sup> For a light soil in a well-watered plain Columella appoints the latter part of August for the first ploughing, while a light soil on a hill

<sup>1</sup> See p. 425.

<sup>2</sup> N. H., XVIII, xxvi, 242.

<sup>3</sup> Vss. 67 f.

<sup>4</sup> Plin. N. H., XVIII, xix, 174 f.

<sup>5</sup> Col. II, iv, 9.

<sup>6</sup> Id. II, iv, 3.

<sup>7</sup> Plin. XVIII, xix, 175.

should not be exposed to the summer heats, but first ploughed early in September.<sup>1</sup>

In general, however, the best season for ploughing good soil in the average climate of Italy was at the beginning of warm weather, (*anni tempore iam incalescente*,) when the weeds had already sprung up, but had not yet ripened their seed.<sup>2</sup> Cato's simple precept is to begin the spring ploughing after the pear-tree has begun to bloom.<sup>3</sup> Varro, in his *Farmer's Calendar*, places the first ploughing in the period between the vernal equinox and the rising of the Pleiades (about May 10).<sup>4</sup> Pliny places it in the succeeding period, between the rising of the Pleiades and the summer solstice;<sup>5</sup> but here he has probably made a mistake in his compilation. In another place<sup>6</sup> he expresses his preference for the '*sententia, quae non nisi temperatum solum medio uere arari iubet*,' and his disapproval of Virgil's advice to plough in the first part of spring, between the advent of Favonius (February) and the vernal equinox, arguing that under such a method the weeds would grow after ploughing instead of being destroyed by the ploughing, and would consume the strength of the soil.

From all this we may conclude that while the first ploughing might, in special cases, take place at almost any time from February to September, yet as a general rule good soil was first turned not much earlier nor much later than the month of April; and that this time was chosen, not arbitrarily, but because then the ploughing would most effectually destroy the weeds.

When Virgil wrote the verses in which he advises the farmer to plough rich soil in the very first months of the year, he was perfectly aware that his instruction was at variance with the usual practice and with the authority of his predecessors, Cato and Varro. His consciousness of this appears in the words '*iam tum*' (vs. 45). He deliberately advocated what he regarded as a superior method. And in what did its superiority consist? To this question the passage in Theophrastus quoted above<sup>7</sup> furnishes a ready answer. In the opinion of the Greeks the action of frost and snow was useful to the fallows, and to secure the beneficial influence of these they performed the first ploughing in winter. This is precisely the plan that Virgil recommends. 'Plough when spring is new,' he

<sup>1</sup> Col. II, iv, 11.    <sup>2</sup> Id. II, iv, 1. Cf. Varro R. R., I, xxvii.    <sup>3</sup> R. R., cxxxi.

<sup>4</sup> R. R., I, xxx.    <sup>5</sup> N. H., XVIII, xxvii, 257.

<sup>6</sup> Ib. XVIII, xxvi, 242.

<sup>7</sup> P. 427.

says,—that is, in the middle of February,—‘when the ground thaws.’ But winter is not over with the first thaw. The Italian farmer who ploughed his field in February would expose it to a good deal of frost and to some snow,<sup>1</sup> and would thus secure the advantages of the Greek winter ploughing.

That this was Virgil’s intention was the view of Valerius Probus, whose authority ought to have prevented any misapprehension of the passage. His explanation of vs. 48 is: *bis sentit frigus, semel deficiente hieme, initio ueris, iterum post sementem; bis solem, semel aestate qua cessat, iterum qua fructum refert.*<sup>2</sup>

Verses 47–49 are then to be regarded, not as an abrupt transition to another method or as inconsistent with the context in any way, but as a statement of the poet’s reason for advocating a plan at variance with the common practice. What he says is substantially this: ‘Begin to plough in the early spring, as soon as the frost permits; for thus you will expose your grain-field to the action of two winters as well as of two summers, and that is the kind of grain-field that satisfies the farmer’s fondest hopes . . . Come, then, turn the rich soil in the very first months of the year,’ etc. With this interpretation the passage is perfectly clear and consistent throughout, and entirely free from the difficulty which led Wagner to reject our three verses.

The cause of Pliny’s uncertainty as to Virgil’s meaning now becomes obvious. A Roman familiar with the common practice, on reading Virgil’s directions, would find them incomplete at one point. Did Virgil intend that his early-spring ploughing should supersede the usual April ploughing, or should be additional to it, making four ploughings in all? In one place Pliny assumes that the April ploughing is to be omitted, and condemns Virgil’s plan, as we have seen, for providing no way of destroying the weeds. In another place, quoted at the beginning of this article, he seems to lean to the other view, and says Virgil is thought to have intended four ploughings. Those who thought so were undoubtedly right. According to Heyne’s interpretation, Virgil’s plan would be open to Pliny’s criticism. But Virgil was inculcating the Greek practice of four ploughings, and under that system, as Theophrastus tells us, the second ploughing was appointed for the

<sup>1</sup> I happen to have a record of the fact that the night of March 1–2 (1867), when I rode from Rome to Florence, was extremely cold, and during the last part of the journey snow was falling.

<sup>2</sup> P. 32, Keil.

destruction of the weeds.<sup>1</sup> We cannot suppose that Virgil intended to have it omitted. These then are his four ploughings: (1) in early spring, (2) in April, (3) in summer, (4) in the fall, just before sowing.

## II. FALLOWING AND ROTATION.

These subjects receive brief treatment in verses 71-83, a passage bristling with difficulties, as the diversity of views among the commentators sufficiently attests. The latest English editor of Virgil, Dr. Kennedy, has discussed the matter at some length in his second edition, and presented his views in a note which shows at least that he has honestly grappled with all the difficulties in his path. I cannot say the same of any previous editor. But I find Dr. Kennedy's conclusions highly unsatisfactory, and cannot believe that his interpretation will be accepted as final.

I will first print the verses in full from Ribbeck :

- 71 *Alternis idem tonsas cessare noualis,*  
*et segnem patiere situ durescere campum ;*  
*aut ibi flaua seres mutato sidere farra,*  
*unde prius laetum siliqua quassante legumen*  
 75 *aut tenuis fetus uiciae tristique lupini*  
*sustuleris fragiles calamos siluamque sonantem.*  
*urit enim lini campum seges, urit auenae,*  
*urunt Lethaeo perfusa papauera somno :*  
*sed tamen alternis facilis labor, arida tantum*  
 80 *ne saturare fimo pingui pudeat sola neue*  
*effetos cinerem immundum iactare per agros.*  
*sic quoque mutatis requiescunt fetibus arua,*  
*nec nulla interea est inaratae gratia terrae.*

In the first six verses the poet recommends that the land shall not be required to bear a crop of grain every year, but that either periods of repose shall alternate with the periods of production, or that a rotation of crops shall be instituted, in which grain shall alternate with pulse, vetch, or lupine. So much is clear. The first point in dispute turns on the meaning of 'alternis cessare' (71) and of 'mutato sidere' (73). How often could a farmer who followed Virgil's instructions plant a crop of grain in a given field—every other year, or once at most in three years? In regard to 'mutato sidere,' all since Heyne are agreed that it means 'at another

<sup>1</sup> C. P. l. l. page 427.



season,' but all do not apply this meaning in the same way. Those who suppose that Virgil contemplates a crop every other year,—Martyn, Keightley, Daubeny,<sup>1</sup> Conington, and others,—understand that the pulse-crop is to be planted in the spring and the grain sown in the fall, of the same year. Wagner, followed by Forbiger, explains 'mutato sidere' as equivalent to 'alio (alterius) anni tempore'; in other words, the pulse-crop is to be planted in the spring of one year, and the wheat or spelt sown in the fall of the next year, leaving the field entirely free for the usual ploughings. This, of course, would require an interval of two years between each two successive grain-crops. Dr. Kennedy, dissenting from all these commentators, lays great stress on the meaning of 'alternis' in vss. 71 and 79. Careful study of the context, he says, convinces him "that the word *must* have precisely the same meaning in both lines, and that this meaning is 'alternis cessationibus,' 'by fallowing at intervals,' *i. e.* from time to time." He then presents his view of the passage in a paraphrase, which it will be convenient to quote in full here, though we are not at present concerned with all of it: "*You shall likewise suffer the reaped fields to lie idle at intervals and the lazy ground to gain vigor by inaction; or, if you cannot afford this, you shall at another season of the year sow yellow corn-crops in the soil from which you have previously raised the legume luxuriant with rattling pod, or the slight plants of the vetch, and the frail stalks and crackling forest of the bitter lupin. For, as to a flax-crop, an oat-crop, a crop of poppies saturate with Lethaeian slumber, each of these scourges the ground. But yet by intervals of idleness the effort becomes easy, provided you do not spare to manure the soil abundantly with rich dung, and to throw the dirty wood-ash over the exhausted fields. Thus even with a change of crops, the fields recover strength, and the land, though in the mean time unploughed, is not ungrateful; i. e. land so fallowed and manured will be able to support a scourging crop (flax, etc.) in the next spring, succeeded by an autumn sowing of corn; and both crops will be so abundant as amply to repay with usury the loss of a year and the expenditure of manure.*"

If I understand Dr. Kennedy's position, he supposes Virgil to recommend a year of repose for the land now and then, and if the farmer thinks he cannot afford to lose a whole year, he is told that he can more than make up the loss by planting a green crop the

<sup>1</sup> Lectures on Roman Husbandry, p. 125.

next spring, that is, during the ploughing period. But if the farmer actually gains by this method, why should he put it in practice only 'now and then'? Why not let the land rest as often as possible, that is, one year in every three, if in that way he can raise crops so abundant as amply to repay *with usury* the loss of time? It would seem that Dr. Kennedy's own reasoning should have led him to accept Wagner's theory of a crop of grain once in three years.

The argument in favor of the latter view seems at first sight perfect. The farmer has just been told to begin to plough in the early spring, and it was well understood that the ploughing was to be repeated in summer and autumn; the land was to be mellowed under the summer sun. Then the crop, sown in autumn, occupied the ground until the latter part of the next summer. Not till the spring of the third year could he begin to plough for the second crop, which he would reap in the fourth year. The directions already given, therefore, clearly contemplate an alternation of productive and unproductive years, of years of ploughing and years of harvest. Now we cannot suppose that Virgil is merely repeating in vss. 71 f. what he has just said; and if the supposition were possible on other grounds, it would be precluded by his use of 'idem,' which implies, as Conington has rightly explained, 'that the rules already given do not exhaust the subject.' Yet it would amount to this if 'alternis' means 'every other year.'

A further argument is based on the words 'situ' (72) and 'inaratae' (83). 'Situs,' as used by Columella,<sup>1</sup> implies entire freedom from tillage, and shows that the poet has in view a period of repose during which the land shall be not only unproductive but unploughed. To meet this requirement we must suppose a third year to intervene between the harvesting of one crop and the spring ploughing with which the preparation for the next is begun. The use of 'inaratae' implies the same thing, according to the usual interpretation of vss. 82 f., which Dr. Kennedy unjustly characterizes as 'very harsh.' But the harshness is entirely due to the form in which Dr. Kennedy chooses to put it,—'and the thanklessness (nulla gratia) of unploughed ground in the mean time exists not.' This is a translation, I suppose, of Ladewig's version, which has no doubt sacrificed grace to clearness: 'und dass der unbestellte Acker keinen Lohn bringt, findet nicht statt.' In his first edition, when he agreed with the German editor, Dr. Kennedy treated this somewhat uncouth sentence more kindly: 'and the want of return

<sup>1</sup> R. R., II, ii, 6.

from unploughed (fallow) land is avoided.' The two verses in question contain a statement of the advantage of rotation over fallowing, 'sic' referring to the former method and having its explanation in 'mutatis fetibus.' The advantage is this: that rotation, as well as fallowing, affords relaxation for the land, without, however, leaving it unploughed and unproductive. 'Inaratæ' repeats the idea of 'situ,' and implies that in fallowing there is to be a period during which the land is free, not only from bearing, but from tillage.

Finally, the three-year view, if I may so designate it, finds support in the practice of the Sicilians at the present day.<sup>1</sup>

The two-year view is based on the authority of Probus,<sup>2</sup> and on certain expressions of Varro and Pliny which show that the practice of the ancient Italians was to raise a grain-crop every other year. Pliny defines *nouale* as 'quod *alternis annis* seritur';<sup>3</sup> and Varro recommends fallowing or rotation in these words: 'agrum *alternis annis* relinquere oportet, aut paulo leuioribus sationibus serere, id est quæ minus sugunt terram.'<sup>4</sup> As Virgil's verses (71-76) are little more than a poetical rendering of the rule given by Varro, must not the former's 'alternis' stand for the latter's 'alternis annis'?

So far as this argument is designed to show the actual practice, it certainly affords a strong presumption in favor of the two-year view. But too much stress must not be put upon the meaning of 'alternis.' For after all Virgil does not say 'alternis *annis*,' and if from a general view of the case it seems most probable that he contemplated only one crop in three years, the similarity of Varro's rule would only bring into clearer light Virgil's dissent from the general opinion. 'Alternis' is vague enough to apply to any system of fallowing; it is quite consistent with the two-year theory or with the three-year theory, and is perhaps elastic enough to reach over the intervals between Dr. Kennedy's occasional fallow years, though that does seem to be putting a severe strain upon it. There is danger in dwelling too much on particular words. A surer way to a solution of the difficulty will be to inquire what interpretation may be reasonably put on our author's language taken as a whole, in the light of the context and of such information as we can gather from other sources.

<sup>1</sup> Simond's Travels in Italy and Sicily, p. 476 (quoted by Keightley and Conington).

<sup>2</sup> P. 32 Keil.

<sup>3</sup> N. H., XVIII, xix, 176.

<sup>4</sup> R. R., I, xliv, 2.

We have seen from our comparison of Virgil's directions for ploughing with those of other writers that he not only gives but a slight sketch of a great variety of practice dependent on special circumstances, but in giving a general rule he is distinctly at variance with the prevailing system. Such being the case, we cannot suppose that his instructions on the next subject that claims his attention, fallowing, are intended to be confined to the unusual system recommended by himself, or to any particular practice. If, for example, the soil is one that is ploughed only at seed-time, there could obviously be a crop every other year under this rule. And such soils were not only the '*tellus non fecunda*' of vs. 67; the dark, rich, crumbling soil of Campania, where Virgil spent most of the years in which he composed the *Georgics*,—the soil so much admired by Pliny,<sup>1</sup> and of which Virgil himself says that it has by nature the consistency which it is the object of ploughing to attain,<sup>2</sup>—needed to be ploughed only at seed-time. But with all its fertility it still required its seasons of rest or relief by change of crops. Pliny mentions two methods of rotation on such land, each of which provides a crop of wheat or barley every other year.<sup>3</sup> There were no doubt other soils demanding exceptional treatment, and nothing that I shall say in this discussion is meant to imply that the three-year method was not often practiced, or that even less frequent crops were not the rule in some places and under some circumstances. But we are at present only concerned with the inquiry whether those are right who, with Dr. Kennedy, deny that '*alternis*' in vs. 71 means 'every other year,' and whether Virgil's precepts are here again at variance with the prevailing custom.

In the case of ordinary good soils, if Varro's rule and Pliny's definition do represent the common practice,—which I see no reason to doubt,—certainly Virgil, whatever practice he may have favored himself, must have supposed that his readers would understand by '*alternis cessare*' a rest every other year. Nor is it quite true that when so understood, these verses add nothing to what has been said before. The grain-crop was harvested in the latter part of summer. From this time to the spring-ploughing was an interval of seven months, or, according to Virgil's rule, of five months. The inexperienced farmer would not know from what has been said before that the land was to lie idle during this long period.

<sup>1</sup> N. H., XVII, v. 36 ff.

<sup>2</sup> *Georg.* II, 204.

<sup>3</sup> N. H., XVIII, xxiii, 191.

He might with good reason think he was at liberty to plant a new crop at once, that the thorough working of the ground in preparation for the crop just gathered and during its growth had made it unnecessary for him to go through that long process again. And so far he would be right: the repeated ploughings would not be needed. What he has to be taught is that he must abstain from planting a crop every year, not because the time is needed for ploughing, but because the soil will not bear such a severe requisition on its strength. It must rest at least one year in two, and it is because it rests and becomes hard (*durescere*) that it must be ploughed so thoroughly afterwards.

The argument based on the use of *situ* and *inaratae* remains to be noticed. The former word presents little difficulty; for if the ploughing begins the next spring after the harvest, there is an interval of five or seven months during which the soil may be entirely free from tillage. But 'inaratae' in vs. 83 distinctly implies that the green crop is to occupy the ground, in a system of rotation, during the period when, if fallowing were practiced, it would remain unploughed. The advocates of the two-year view have assumed that the green crop was to be planted in the period of ploughing; but they have not shown that such an arrangement was practicable, or if practicable, that it existed; and they appear to have overlooked the significance of the language of verse 83, which leaves little doubt that Virgil does not here contemplate such a method. The question then remains: where is there room for the pulse-crop, if there is a grain-crop every other year?

In the great diversity of opinion that exists in regard to the application of 'mutato sidere' in vs. 73, there is one point on which the advocates of all theories are agreed, namely, that the pulse was to be planted in spring. They all explain the sentence, 'planting the spelt at a different season (autumn) from that in which the pulse was planted (spring).' Will the sentence bear this interpretation? Observe that nothing is said of *planting* the pulse; for *sustuleris* does not mean 'raised' as Dr. Kennedy renders it, but 'gathered' or 'removed,' a meaning it frequently has in this connection.<sup>1</sup> What Virgil says in vss. 73-76 is, in substance: 'Thou shalt plant the spelt, (changing the season) in the field from which thou hast before gathered the pulse.' These words might mean 'plant the

<sup>1</sup> E. g. Plin. N. H., XVIII, vii, 79, xiv, 135, xxiii, 191. Cf. Nonius 404, 29.

spelt at a different season from that in which it is usually planted,' *i. e.* in the spring instead of the fall. This method is recognized by Roman agricultural writers as suitable for some places and circumstances, but they are so positive and so unanimous in condemning it as a rule<sup>1</sup> that we must suppose Virgil would have spoken more distinctly had he intended to recommend it. Setting this aside, then, is it not the simplest way to take 'mutato sidere' in connection with 'sustuleris'? The meaning will then be: 'When you have gathered the pulse, plant there (not immediately, but at a different season) the spelt.' This seems to me the most natural interpretation of the author's words. Now what was the actual practice?

Rotation of crops was well known to the Romans, and beans and other leguminous plants, as well as vetch and lupine, are mentioned as useful intermediate crops. But I find no reason for supposing that these crops were planted in the spring. Virgil's own account does not help us much: he says the bean should be planted in the spring,<sup>2</sup> but the vetch and other legumes in the fall.<sup>3</sup> Other writers show that all these crops might be planted at either season,<sup>4</sup> but the autumn was preferred.<sup>5</sup> In regard to the bean, which Virgil is usually thought to mean by 'legumen,' the common opinion is expressed in an old saw quoted by Pliny and Columella,<sup>6</sup> to the effect that the stalks of a winter crop are worth more than the beans of a crop grown in spring; and Pliny says that Virgil's direction to plant beans in the spring represents only the local practice of the Mantuan district.<sup>7</sup> In regard to lupine, which seems to have been the favorite intermediate crop, our information is more explicit. It was to be sown in the fall and used for pasture or fodder in winter; it would then grow up again, was cut for fodder just before the spring ploughing, and then turned in, as the weeds would be on fallow land.<sup>8</sup>

In the light of these facts the common supposition that Virgil's intermediate crop was to be planted in spring falls to the ground.

<sup>1</sup> Cato R. R. xxxv, quoted by Plin. N. H., XVIII, xvii, 164. Col. R. R., II, vi, 2, ix, 7 f. Varro, I think, does not mention it.

<sup>2</sup> Georg. I, 215. <sup>3</sup> Ib. 227 ff.

<sup>4</sup> Plin. N. H., XVIII, 123, 135, 137, 191. Col. R. R., II, x, 29.

<sup>5</sup> Plin. N. H., XVIII, xii, 120, xxvii, 257. Col. R. R., II, x, 2, 9. Varro, R. R., I, xxxiv.

<sup>6</sup> Plin. N. H., XVIII, xii, 120. Col. R. R., II, x, 9.

<sup>7</sup> N. H., XVIII, xii, 120.

<sup>8</sup> Plin. N. H., XVII, ix, 54, XVIII, xiv, 135 f.; Pallad. Sept. 9, Mai. 4.

It was to be planted in the fall and gathered in the spring ; after it came the grain-crop, not at once, but waiting till its proper season. The pulse therefore occupied the ground during the period between harvest and spring, when, if fallowing were practiced, the land would be 'inarata.'

We thus find that Virgil's instructions are quite consistent with Varro's rule, and with the two-year system which the modest dimensions of the ordinary Italian farm probably made very general. Yet Virgil chooses to leave his language vague ; it applies as well to a three-year system, or to any system which secures for the land the relaxation it needs, by relieving it 'every other time' from the burden of bearing the heavy grain-crop.

And here it will be convenient to consider the meaning of 'alternis' in vs. 79, though this question does not come next in order. Dr. Kennedy insists that this word *must* have the same meaning as 'alternis' in vs. 71, *i. e. alternis cessationibus*, and on this assumption he avowedly bases his interpretation of the whole passage, so far as he differs from other commentators. The latter might retort that 'alternis' *must* refer to rotation, because verses 82 f., with which 'sic' connects it, clearly refer to that method only. But Dr. Kennedy carries his reasoning to its legitimate result, which requires him to make vss. 82 f. refer to *both* fallowing and rotation. This is pretty nearly a *reductio ad absurdum*. The result at which Dr. Kennedy arrives is directly opposed to the first half of the passage, where Virgil in perfectly clear language recommends fallowing and rotation as *alternatives* ; and there is nowhere the slightest intimation that one is to supplement the other. The fallacy in Dr. Kennedy's reasoning is not hard to detect. *Alternis* stands for *alternis uicibus* and means 'every other time.' If in any place it has a more definite meaning than this, it gets it either from the context or from the reader's presumed knowledge of the facts. If in vs. 71 it means *alternis cessationibus*, it gets that meaning from its connection with 'cessare' ; and for a precisely similar reason it must mean, in vs. 79, *alternis laboribus*. The words 'alternis facilis labor' are equivalent to 'labor (agri) facilis est, si alternis laborat,' that is, the field will easily make the effort (required to bear a heavy crop) *one time in two*. What this effort is to alternate with,—a light crop or a period of repose,—the words themselves do not indicate ; but coming after vss. 71-76, they may refer to both, or to either. Now I think Dr. Kennedy's remark on the identity of meaning of *alternis* in the two places is a valuable

suggestion, though he has put it too strongly and reasoned on it too narrowly. The repetition of the word could not fail to call up in the reader's mind the ideas connected with it in the place where it first occurred. But in vs. 71, although 'alternis' is connected grammatically with 'cessare' and applies strictly to vss. 71 f. only, yet it is connected in thought with vss. 73-76 as well, and standing first, it gives the keynote to the whole passage, expressing the essential element of both of the methods proposed. And I believe it has the same reference to both methods in vs. 79.

We may now proceed to the one remaining problem which has divided the commentators on this passage,—the use of 'enim' in vs. 77, and the connection of the verses it introduces with the context. There is a general agreement in accepting verses 77 f. as a disparagement of flax, oats, and poppies as intermediate crops, but in understanding that in vss. 79 f. Virgil permits their use as such, provided the ground be well manured. But then 'enim' at once becomes a stumbling-block; for it is quite clear that the unsuitableness of flax and the rest as intermediate crops is not offered as the reason for the rules given in the preceding verses. Those who take 'enim' in its ordinary sense are therefore driven to suppose an ellipsis, and understand the connection in some such way as this: 'Plant pulse, vetch, lupine as intermediate crops, (not flax, or oats, or poppies,) for flax, oats, and poppies exhaust the soil; still, the ground will bear even these, if you manure it well.' This view of Heyne and the older commentators is accepted by Ladewig and Kennedy. Another solution of the difficulty, suggested by Hand,<sup>1</sup> has been accepted by Wagner and Forbiger. According to Hand, *enim* here, as in some other places, is equivalent to *quidem*, and gives the sentence a concessive force. This is Wagner's paraphrase: 'Urit quidem linum, avena, papaver; sed, si alterna seres, tamen facilis erit agri labor. Modo alterna serens, stercorando agrum refice ac recrea.'

I shall not attempt to decide between these two explanations. Either could be accepted, if the result gained were on the whole satisfactory; but I doubt whether any one has ever been quite satisfied with either of the interpretations thus obtained. For neither solution reaches the root of the difficulty. Back of the verbal question lies a question of fact, strangely overlooked in the discussion, the answer to which may supersede the question of lan-

<sup>1</sup>Tursellinus, II, p. 387.



guage entirely, or present it in a very different light. The question is this: Are flax, oats, and poppies to be classed with the heavy crops, like grain, or with the intermediate or green crops? With the sole exception, so far as I am aware, of Conington, all editors have assumed that they are to be classed as green crops. Conington's note is as follows: 'The general sense is that the same crop, invariably repeated, will exhaust the soil. Flax, oats, and poppies are specified merely as instances of this rule, though of course they are chosen as significant instances.'<sup>1</sup> As Conington gives no reasons for his opinion, I will here state the considerations that have led me to the same conclusion.

The Romans included flax among the *legumina* in their loose classification, which gave a similar place to barley, 'because a gruel was made of it.'<sup>2</sup> The oat, too, which was regarded as a degenerated species of barley,<sup>3</sup> Pliny places among the legumes, mentioning oat-meal gruel as in use among the Germans. In Italy it does not appear to have been looked upon as a grain at all; it was raised for pasture like lupine, only so much being allowed to ripen as would furnish seed for a new crop.<sup>4</sup> Columella therefore classes it as a '*genus pabulorum*.'<sup>5</sup> Pliny alone, I believe, treats of the poppy,<sup>6</sup> and that among garden plants;<sup>7</sup> though he speaks of one variety growing wild, mostly in ploughed fields with barley. None of these crops is anywhere mentioned as an intermediate crop, and the sole presumption in favor of their use as such is derived from the fact that two of them were loosely classed as legumes. But what are the essential characteristics of an intermediate crop?

In modern husbandry 'the place of flax in a rotation of crops is various, but in general it is considered as a corn or exhausting crop when the seed is allowed to ripen; and as a green, or pea or bean crop, when the plant is pulled green.'<sup>8</sup> This distinction, based on the actual effect on the soil, is the real distinction between principal and intermediate crops. To the latter class belong those, as Varro says,<sup>9</sup> '*quae minus sugunt terram*,' and *legumina* cannot be included among them unless they are light crops. Now, on the

<sup>1</sup> Conington attributes the same view to Wagner, but with Forbiger I understand the latter differently.

<sup>2</sup> Col. R. R., II, vii, 1, xiii, 3.

<sup>3</sup> Plin. N. H., XVIII, xvii, 149. Cf. Virg. Ecl. V, 36 f.

<sup>4</sup> Col. R. R., II, x, 32. <sup>5</sup> Id. ib. 24. <sup>6</sup> N. H., XIX, viii, 168.

<sup>7</sup> Cf. Liv. I, liv, 6, Georg. IV, 131.

<sup>8</sup> Loudon, Encycl. Agric. § 5884.

<sup>9</sup> Above, p. 434.

one hand, we have plenty of evidence that beans, vetch, and especially lupine, were regarded as less exhausting than grain, if not actually beneficial to the soil;<sup>1</sup> and, on the other hand, Virgil's express language is that flax, oats, and poppies are highly injurious.

These considerations make it impossible for me to believe that flax and the rest are here mentioned as intermediate crops, and with Conington I take them as striking examples of crops that impoverish the soil. 'Enim' then has its proper meaning and its proper use; it introduces the reason why it is necessary either to allow the land to rest or to relieve it with lighter crops. No doubt these new examples of heavy crops come with some suddenness on a reader unfamiliar with the subject; but a poet must be allowed some liberty in varying his expression, and the abruptness is not so great as it appears. For Virgil's words convey no implication that these are intermediate crops, and he is not responsible if the modern reader, forgetting that an intermediate crop must be a light crop, thrusts upon his language a meaning which not only the facts of the case but that very language excludes. For the emphasis given to *urit* by reiteration and by its position at the head of each portion of the sentence, is so great as to throw everything else into the background,—an important point, to which the common explanation pays no heed. Virgil's main thought is the exhaustion which the ground suffers. What crops he mentions as illustrations are comparatively unimportant; could he suppose his reader would confuse them with light crops?

The conclusions to which our examination of the difficulties attending the interpretation of this passage have thus far led us may now be succinctly stated:

1. That in vss. 71 f. Virgil has in view the common practice of sowing a crop every other year, as well as those systems in which there is a crop only once in three years or less frequently.

2. That in vss. 73-76 the light crop, in the two-year system, is to occupy the ground during the winter that follows the harvest; and in any system, at some time other than the customary ploughing period.

3. That vss. 77 f. explain why the land needs the relief just recommended, flax, oats, and poppies being given as instances of exhausting crops.

<sup>1</sup> Col. R. R., II, x, 1, 7, xiii, 1; Plin. N. H., XVIII, xii, 120, xv, 137; Pallad. Sept. 9, Mai. 4.

4. That 'alternis' in vs. 79 repeats the idea of 'alternis' in verse 71, and though it may refer to only one of the methods introduced by the latter, the reader would naturally refer it to both.

This last point brings us face to face with a difficulty which received scanty notice from any commentator before Dr. Kennedy, who has taken refuge from it in a position which, as we have seen, must be regarded as untenable. This difficulty, which exists quite independently of the other questions that have been discussed, may be stated thus: By common consent verses 82 f. are accepted as a statement of the advantage of rotation over fallowing. Now since 'sic,' which introduces this statement, sums up the contents of the preceding sentence, it is clear that 'alternis' in vs. 79 must refer to rotation only, and not to both rotation and fallowing, as the reader would naturally understand it.

Nor is this the only difficulty that vss. 82 f. present. 'Sic' refers not only to 'alternis facilis labor,' but to the rest of vss. 79-81 as well, so that Virgil appears to recommend manuring only in connection with rotation, tacitly implying that it is unnecessary in fallowing. Now if there is one proposition on which all authorities on Roman husbandry are agreed, it is that a grain crop is in no case to be sown without manuring;<sup>1</sup> and on the other hand the light crops were regarded by some as actually enriching the soil, and by all as making little requisition on its strength. It seems therefore very unlikely that Virgil could have intended to prescribe liberal manuring as necessary in the one case and not in the other.

Finally, why should a statement of the advantages of rotation over fallowing be placed here, where the poet has already taken leave of those subjects and is well embarked on another? Verses 82 f. are an awkward interruption to what would otherwise be a continuous treatment of the subject of manuring, extending from vs. 79 to the end of vs. 93. In fact,—as a friend to whom I pointed out this difficulty has suggested to me,—they separate two verses (81 and 84), which seem to have a particularly close connection, the mention of ashes as manure naturally leading to the thought of burning the stubble.

From these difficulties I see no escape, as the text now is. The incongruity of the verses in question was perceived by Schrader, who, if he is correctly quoted by Wagner and Ribbeck, proposed to place them after vs. 78. I have unfortunately not been able to

<sup>1</sup> Plin. N. H., XVIII, xxiii, 192.

find Schrader's own note on the passage, and therefore cannot say how much of the above argument has been anticipated by him; and I quite fail to guess his reason for the place he has chosen for the offending verses. Their proper place is after vss. 71-76, with which they are closely connected. The passage would then read thus:

- 71 Alternis idem tonsas cessare noualis  
 et segnem patiere situ durescere campum;  
 aut ibi flaua seres mutato sidere farra,  
 unde prius laetum siliqua quassante legumen  
 aut tenuis fetus uiciae tristisque lupini  
 76 sustuleris fragiles calamos siluamque sonantem;  
 82 sic quoque mutatis requiescunt fetibus arua,  
 83 nec nulla interea est inaratae gratia terrae.  
 77 Urit enim lini campum seges, urit auenae,  
 urunt Lethaeo perfusa papauera somno:  
 sed tamen alternis facilis labor; arida tantum  
 80 ne saturare fimo pingui pudeat sola, neue  
 effetos cinerem immundum iactare per agros.  
 saepe etiam steriles incendere profuit agros  
 atque leuem stipulam crepitantibus urere flammis;  
 siue, etc.

It may be readily conceded that the sentence 'Urit enim,' etc., suffers a little by its removal to a greater distance from vss. 71-76; and if the concurrence of two verses closing with the same word (*agros*) was regarded as offensive and unvirgilian, we have perhaps, in these two supposed difficulties, a suggestion of the motive for a transposition,—if an intentional transposition has been made,—which would so easily remedy both of them. But it will not be contended that the first of these difficulties is at all serious. The second has apparent, but only apparent, foundation in the fact that such repetitions are rare in Virgil. I have found only one example in the Georgics<sup>1</sup> and seven in the Aeneid,<sup>2</sup> the first half of the latter containing none whatever. It is not improbable that this small number would have been made smaller, had the poet lived to complete his work. Such jingles as

dignus patriis qui laetior esset  
 imperiis et cui pater haut Mezentius esset<sup>3</sup>

<sup>1</sup> I, 407.

<sup>2</sup> VII, 653, VIII, 271, 396, IX, 544, X, 521, XI, 204, XII, 656.

<sup>3</sup> VII, 653.

can hardly be regarded as fair examples of Virgil's taste, and are little in keeping with the sober tone of the Georgics and the Aeneid. They are more at home in the lively style of Ovid, who has them in great number in the Metamorphoses, or in the Eclogues, where there are a few familiar examples.<sup>1</sup>

But giving these considerations their due weight, and leaving Ovid and the Eclogues out of account entirely, no one will assert that Virgil would not have written vs. 84 immediately after vs. 81 in the same book in which he has written

Ecce inimicus atrox magno stridore per auras  
insequitur Nisus; qua se fert Nisus ad auras.<sup>2</sup>

Nor will any one believe that Virgil's revision would have eliminated all the instances in the Aeneid, who has observed the practice of Lucretius in this particular. The great influence of this poet on Virgil, and especially on the Georgics, is as well known as his 'fondness for alliteration, assonance, repetition of the same or similar words, syllables and sounds.'<sup>3</sup> Lucretius admits repetition of final words in the same or nearly the same form very freely, often from mere love of assonance, or from indifference;<sup>4</sup> in many instances, however, rhetorical effect is clearly aimed at. Of the latter sort are those cases in which the repeated word, without being itself particularly emphatic, serves as a link to continue the chain of thought from one sentence to another. A good example is found in the passage where men's belief in gods is attributed to the deification of the phantoms of their own imaginations:

aeternamque dabant uitam, quia semper eorum  
subpeditabatur facies et forma manebat,  
et tamen omnino quod tantis uiribus auctos  
non temere ulla ui conuinci posse putabant.  
fortunisque ideo longe praestare putabant,  
quod mortis timor haut quemquam uexaret eorum, etc.<sup>5</sup>

The following passage, though there is a slight change of form, illustrates the same usage:

<sup>1</sup> Ecl. VIII, etc.

<sup>2</sup> Vs. 407.      <sup>3</sup> Munro, Lucretius, I, pp. 325 f.

<sup>4</sup> As I, 393, 719, 793, etc. Cf. Munro's critical note on V. 586.

<sup>5</sup> V. 1175 ff.

tum porro si nil esset quod inane uocaret,  
 omne foret solidum; nisi contra corpora certa  
 essent quae loca complerent quaecumque tenerent,  
 omne quod est, spatium uacuum constaret inane.  
 alternis igitur nimirum corpus inani  
 distinctumst, etc.<sup>1</sup>

Two of the instances found in the *Aeneid*<sup>2</sup> may perhaps be referred to this class; but a still better example of this species of anaphora is the repetition of *agros* in the verses before us,—if Virgil wrote them so.

At any rate sufficient has been said to show that this repetition has no weight whatever as an objection to the reading I have proposed, which must therefore stand or fall according as the arguments in its favor shall be regarded as sufficient or insufficient to overbalance the weight of MSS. authority. These arguments are implied in the objections, stated above, to the text as it now stands. The transposition proposed would free the passage from all the difficulties there set forth, and render the course of thought natural and consistent throughout. We should have first, a presentation of two ways of relieving the exhausted land (vss. 71-76), with a statement of the advantage of the second over the first (82 f.). Then would come the reason why such relief is needed (77 f.) and from that a skillful transition to the subject of manuring, which would extend without interruption through vs. 93, where the poet proceeds to other methods of improving the soil before sowing.

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<sup>1</sup> I, 520 ff. Other examples are III, 429, V, 501, VI, 280, 824.

<sup>2</sup> IX, 544, X, 521.